Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1-30 (Cancelled)

31. (Previously presented) The method of claim 33 wherein said first message and said second message are communicated through an external data network.

32. (Previously presented) The method of claim 33 wherein the step of comparing comprises a further step of determining congruence of said first sequence and said second sequence to ascertain routing correctness of said target lightpath.

33. (Currently amended) A method for monitoring lightpaths in an optical network comprising a plurality of optical nodes, each associated with a respective nodal identifier, said optical nodes interconnected by wavelength-multiplexed links and exchanging control signals through a control network, the method comprising the steps of:

modulating an optical signal of each lightpath by an identifying optical signature;

storing at each optical node~~, for each lightpath planned to traverse said each optical node~~:

[[an]] identifiers of ~~a respective~~ optical signatures of specific lightpaths designated to traverse said each optical node; ~~and~~

identifiers of adjacent optical nodes designated to be along ~~said~~ each lightpath from among said specific lightpaths; and

identifiers of optical signatures detected at said each optical node;

selecting, at a command-line interface communicatively coupled to a start optical node, a target lightpath connecting a source optical node to a destination optical node and traversing said start optical node;

~~and a start optical node along said target lightpath, and at a command-line interface communicatively coupled to said start optical node:~~

determining, at said command-line interface, a target optical signature stored at said start optical node and associated with said target lightpath;

progressively communicating a first message comprising said target optical signature to adjacent optical nodes to determine a first sequence of optical nodes designated to form said target lightpath;

progressively communicating a second message comprising said target optical signature to adjacent optical nodes to determine a second sequence of optical nodes actually receiving said target optical signature; and

comparing said second sequence to said first sequence;

~~wherein said start optical node is an intermediate optical node between a source optical node and a destination optical node of said target lightpath, and wherein said first sequence is determined as:~~

~~a list of preceding nodes, each storing an identifier of said target optical signature, between said start optical node and said source optical node; and~~

~~a list of succeeding nodes, each storing an identifier of said target optical signature, between said start optical node and said destination optical node~~

and

wherein the steps of determining, progressively communicating the first message, progressively communicating the second message, and comparing are performed without interacting with centralized network management system.

34. (Currently amended) [[A]] The method of claim 33 ~~for monitoring lightpaths in an optical network comprising a plurality of optical nodes, each associated with a respective nodal identifier, said optical nodes interconnected by wavelength-multiplexed~~

links and exchanging control signals through a control network, the method comprising the steps of:

modulating an optical signal of each lightpath by an identifying optical signature;

storing at each optical node, for each lightpath planned to traverse said each optical node:

an identifier of a respective optical signature; and

identifiers of adjacent optical nodes designated to be along said each lightpath;

selecting a target lightpath connecting a source optical node to a destination optical node and a start optical node along said target lightpath, and at a command-line interface communicatively coupled to said start optical node:

determining a target optical signature stored at said start optical node and associated with said target lightpath;

progressively communicating a first message comprising said target optical signature to adjacent optical nodes to determine a first sequence of optical nodes designated to form said target lightpath;

progressively communicating a second message comprising said target optical signature to adjacent optical nodes to determine a second sequence of optical nodes actually receiving said target optical signature; and

comparing said second sequence to said first sequence;

wherein said start optical node is an intermediate optical node between a source optical node and a destination optical node of said target lightpath, and

wherein said second sequence is determined as:

a list comprising each preceding node which detects said target optical signature along said target lightpath between said start optical node and said source optical node; and

a list comprising each succeeding node which detects said target optical signature along said target lightpath between said start optical node and said destination optical node.

35. (Currently amended) A method for monitoring lightpaths in an optical network comprising a plurality of optical nodes, each associated with a respective nodal identifier, said optical nodes interconnected by wavelength-multiplexed links and exchanging control signals through a control network, the method comprising the steps of:

modulating an optical signal of each lightpath by an identifying optical signature;

storing at each optical node, for each lightpath planned to traverse said each optical node:

an identifier of a respective optical signature; and

identifiers of adjacent optical nodes designated to be along said each lightpath;

selecting a target lightpath connecting a source optical node to a destination optical node and a start optical node along said target lightpath, and at a command-line interface communicatively coupled to said start optical node:

determining a target optical signature stored at said start optical node and associated with said target lightpath;

progressively communicating a first message comprising said target optical signature to adjacent optical nodes to determine a first sequence of optical nodes designated to form said target lightpath;

progressively communicating a second message comprising said target optical signature to adjacent optical nodes to determine a second sequence of optical nodes actually receiving said target optical signature; and

comparing said second sequence to said first sequence;

wherein the step of progressively communicating said first message further comprises:

identifying at said start optical node a current node ~~adjacent to said start optical node~~ towards said source optical node and designated to be on said target lightpath according to provisioning data stored at said start optical node;

sending said first message from said start optical node to said current node, <u>said current node being adjacent to said start optical node</u>;

responsive to an indication that said current node is said source optical node,

~~sending from said current node a completion indication to said start optical node~~

<u>receiving at said start optical node a completion indication from said current node</u>;

responsive to an indication that said current node is not said source optical node:

identifying at said current node a preceding node ~~adjacent to said current node and~~ designated to be on said target lightpath according to provisioning data stored at said current node;

~~sending, from said current node, an identifier of said preceding node to said start optical node;~~

<u>receiving, at said start optical node, an identifier of said preceding node from said current node, said preceding mode being adjacent to said current node;</u>

setting said preceding node as a current node; and

returning to the step of sending said first message.

36. (Currently amended) The method of claim 35 wherein the step of progressively communicating said first message further comprises:

identifying at said start optical node a current node ~~adjacent to said start optical node~~ towards said destination optical node and designated to be on said target lightpath according to provisioning data stored at said start optical node;

sending said first message from said start optical node to said current node, the current node being adjacent to said start optical node;

responsive to an indication that said current node is said destination optical node,

~~sending from said current node a completion indication to said start optical node~~

receiving at said start optical node a completion indication from said current node;

responsive to an indication that said current node is not said destination optical node:

identifying at said current node a succeeding node ~~adjacent to said current node and~~ designated to be on said target lightpath according to provisioning data stored at said current node;

~~sending, from said current node, an identifier of said succeeding node to said start optical node;~~

receiving, at said start optical node, an identifier of said succeeding node from said current node, the succeeding node being adjacent to said current node;

setting said succeeding node as a current node; and

returning to the step of sending said first message.

37. (Currently amended) A method for monitoring lightpaths in an optical network comprising a plurality of optical nodes, each associated with a respective nodal identifier, said optical nodes interconnected by wavelength-multiplexed links and exchanging control signals through a control network, the method comprising the steps of:

modulating an optical signal of each lightpath by an identifying optical signature;

storing at each optical node, for each lightpath planned to traverse said each optical node:

an identifier of a respective optical signature; and

identifiers of adjacent optical nodes designated to be along said each lightpath;

selecting a target lightpath connecting a source optical node to a destination optical node and a start optical node along said target lightpath, and at a command-line interface communicatively coupled to said start optical node:

determining a target optical signature stored at said start optical node and associated with said target lightpath;

progressively communicating a first message comprising said target optical signature to adjacent optical nodes to determine a first sequence of optical nodes designated to form said target lightpath;

progressively communicating a second message comprising said target optical signature to adjacent optical nodes to determine a second sequence of optical nodes actually receiving said target optical signature; and

comparing said second sequence to said first sequence;

wherein the step of progressively communicating said second message further comprises:

identifying at said start optical node a current node ~~adjacent to said start optical node~~ towards said source optical node and designated to be on said target lightpath according to provisioning data stored at said start optical node;

sending said second message from said start optical node to said current node, said current node being adjacent to said start optical node;

responsive to an indication of absence of said target optical signature at said current node, ~~sending from said current node a completion indication to said start optical node~~ receiving at said start optical node a completion indication from said current node;

responsive to an indication that said current node is said source optical node,

~~sending from said current node a completion indication to said start optical node~~ receiving at said start optical node a completion indication from said current node;

responsive to an indication that said current node is not said source optical node:

identifying at said current node a preceding node ~~adjacent to said current node and~~ designated to be on said target lightpath according to provisioning data stored at said current node;

~~sending, from said current node, an identifier of said preceding node to said start optical node;~~

receiving, at said start optical node, an identifier of said preceding node from said current node, said preceding node being adjacent to said current node;

setting said preceding node as a current node; and

returning to the step of sending said second message.

38. (Currently amended) The method of claim 37 wherein the step of progressively communicating said second message further comprises:

identifying at said start optical node a current node ~~adjacent to said start optical node~~ towards said destination optical node and designated to be on said target lightpath according to provisioning data stored at said start optical node;

sending said second message from said start optical node to said current node, the current node being adjacent to said start optical node;

responsive to an indication of absence of said target optical signature at said current node, ~~sending from said current node a completion indication to said start optical node~~ receiving at said start optical node a completion indication from said current node;

responsive to an indication that said current node is said destination optical node,

~~sending from said current node a completion indication to said start optical node~~

receiving at said start optical node a completion indication from said current node;

responsive to an indication that said current node is not said destination optical node:

identifying at said current node a succeeding node ~~adjacent to said current node and~~ designated to be on said target lightpath according to provisioning data stored at said current node;

~~sending, from said current node, an identifier of said succeeding node to said start optical node;~~

receiving, at said start optical node, an identifier of said succeeding node from said current node, said succeeding node being adjacent to said current node;

setting said succeeding node as a current node; and

returning to the step of sending said second message.

39. (Currently amended) The method of claim 33 further comprising:

sending, from [[a]] said command-line interface communicatively coupled to said start optical node, messages to all neighbouring nodes of said start optical node requesting each to indicate detection of said target optical signature, said all neighbouring nodes being discovered via topology information acquired through said control network;

receiving, at said start optical node, acknowledgments from specific neighboring nodes which detect said target optical signature;

adding identifiers of said specific neighboring nodes to a local-discovery list, said local-discovery list being initially an empty list;

sending, from each specific neighboring node, messages to all successive neighboring nodes of said each specific neighboring node requesting indication of detection of said

target optical signature, wherein said each successive neighboring node is discovered from available topology information;

receiving, at said start optical node, an acknowledgment from each successive neighboring node which detects said target optical signature; and

adding an identifier of said each successive neighboring node which detects said target optical signature to said local-discovery list;

wherein said each successive neighboring node which detects said target optical signature responds only once to a request for indication of detection of said target optical signature.

40. (Currently amended) The method of claim 33 further comprising:

storing at said start optical node a set of identifiers of all optical nodes in said optical network;

sending a message from [[a]] said command-line interface communicatively coupled to said start optical node to each other optical node, said message containing an identifier of said target optical signature and an identifier of said start optical node, said message requesting each individual optical node which detects said target optical signature, to send a response to said start optical node said response including an identifier of said each individual optical node; and

including said identifier of said each individual optical node which detects said target optical signature in a global-discovery list for comparison with said second sequence of optical nodes.

41. (New). The method of claim 33, wherein said first sequence is determined as:

a list of preceding nodes, each storing an identifier of said target optical signature, between said start optical node and said source optical node; and

a list of succeeding nodes, each storing an identifier of said target optical signature, between said start optical node and said destination optical node.